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Ontario Department of Education

Physical Education Facilities

For Secondary Schools

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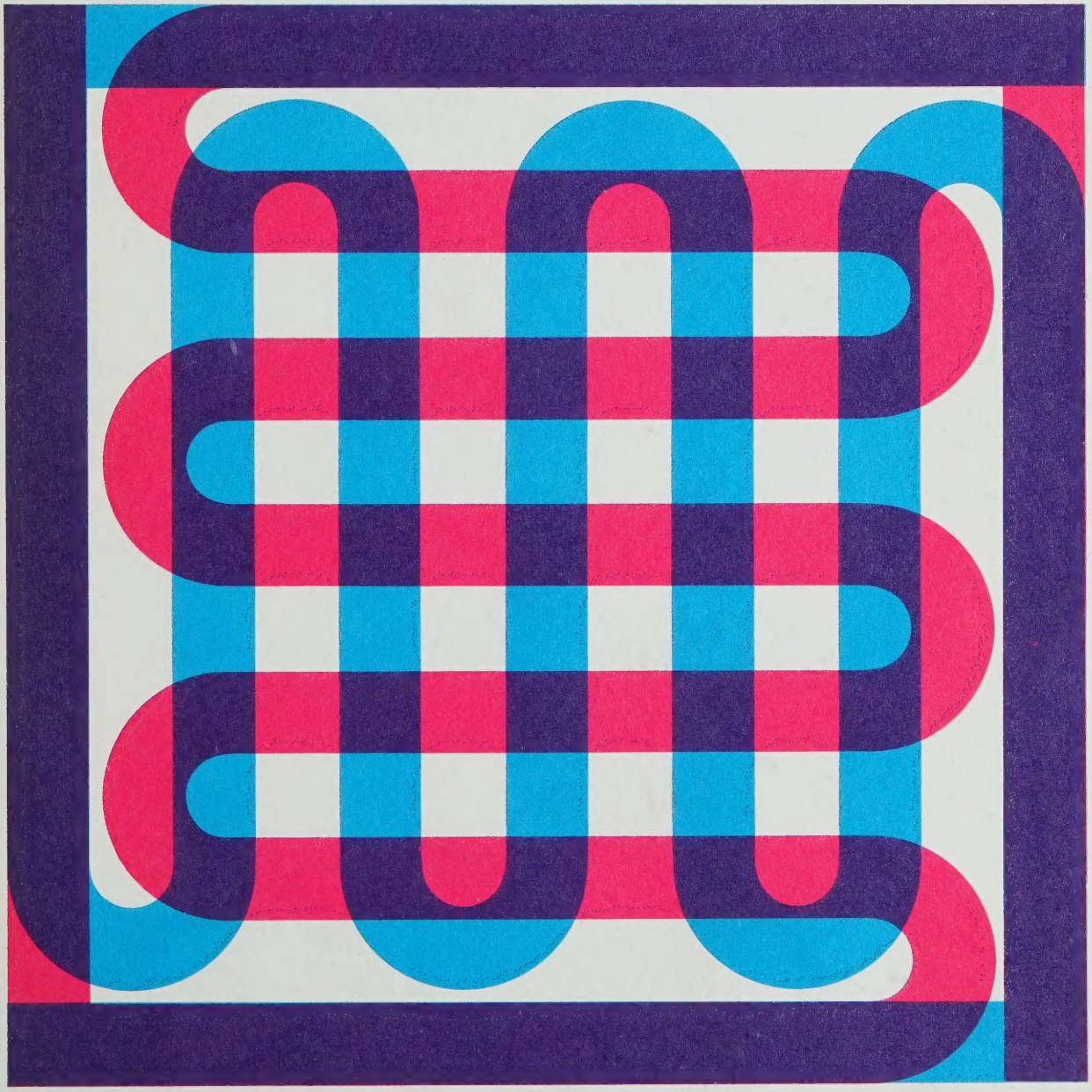

Suggestions for Physical Education Facilities in Ontario Secondary Schools

Prepared by

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The secondary school gymnasium is the instructional area of physical education. It is used for other supplementary activities such as dances, assemblies, plays and public meetings; however, it is primarily and essentially a facility for school use. Planners of secondary school gymnasia should be familiar, therefore, with the programs — both curricular and extra-curricular — which will be carried on in the facility.

The major immediate aims of physical education are to promote the health and physical development of pupils, and to develop physical skills, through vigorous and continuing activity by all members of the group. A well-balanced program in physical education for secondary schools includes:

a) Skill instruction
(the use of physical skill to develop co-ordination)
b) Purposeful Activity
(to develop skill and physical fitness)
c) Social Development
(development of co-operative effort, plus individual initiative and leadership)
d) Carry-over Sport
(e.g. golf, tennis)
e) Intra-mural Sports
f) Inter-scholastic Athletics
g) Other forms of extra-curricular activities such as creative dance, gymnastic meets, demonstrations
h) Mental Development

The secondary school program in physical education in gymnasia includes a variety of activities engaging pupils in both large and small groups. Skill practice and game situations include such things as basketball, volleyball, handball, badminton and games of low organization. Other types of activities carried on in the gymnasium include tumbling, gymnastics, rhythmics and movement, conditioning activities, wrestling and track and field. Intra-murals include mass participation in selected activities. If the school is in a community where large numbers of people attend the inter-scholastic competitions, the provision of seating facilities for the spectators should be considered. It must always be borne in mind that the primary function of the gymnasium is for use by a number of groups engaged in a variety of simultaneous activities.

1. Gymnasium

a) Capacity

In order to provide the full, required activity program, a gymnasium is needed for every 450—500 students in a school operating on a 45-period week.

A single gymnasium will suffice for an enrolment up to 500 pupils. A double gymnasium will accommodate 900—1,000 students.

Where student population exceeds this number, additional teaching stations should be provided. If a swimming pool does not exist as a third station, then the third area, which will accommodate up to 1,400–1,500 students, should be a single gymnasium. Beyond this number, even though part of the program may be carried on in a physical education activity room, the provision of further gymnasium space is more desirable. Allowance should always be made for future expansion.

b) Location

The gymnasium should be planned so that noise will not interfere with other classrooms, and so that it can be used after school hours independent of, and closed off from the rest of the school building. It should be convenient to the playing field.

c) Size

The size of both double and single gymnasia has been determined on the basis of the varied types of activity which are necessary in order to fulfill curriculum requirements. However, these sizes can be further justified in light of the increasing use of gymnasium facilities by outside adult organizations for physical education activity. No additional space is required if bleachers are to be installed.

Single gymnasium – 80'0" x 50'0" (wall to wall interior dimensions). Double gymnasium – 100'0" x 80'0" (wall to wall interior dimensions). Maximum height clear of structure or ceiling 22'0".

d) Floor

A hardwood maple finished floor is recommended. This flooring should not be more than 2" in width. The floor should be of built-up, well ventilated resilient construction. Flooring should run parallel to the main court. All apparatus floor plates and sockets for standards should be counter-sunk and set flush with the top of the floor before the finish floor is laid. The sleeve-type socket should be used and must be set in place before the concrete is poured. Care must be taken to ensure that all court and floor markings conform to the latest rules and regulations as laid down in the latest official handbook of the sport concerned. The number and location of the sockets required must be carefully checked.

e) Walls

Walls should be of smooth masonry block construction. From the floor to a height of 12 feet a washable, protective coating should be applied. Because the walls are used considerably for class instruction and skill practice, it is essential that they be free of projections. There should be no mid-wall heating apparatus, windows, special acoustic treatment etc., lower than 16 feet above floor level. All external corners should be rounded. All fixed equipment such as basketball backboard supports should be installed during construction. Swing-up or swing-away baskets should be installed rather than the stationary type. This makes the *total* floor area available for other activities such as volleyball and badminton. Drinking fountains should *not* be installed in the gymnasium.

f) Roof Structure

The roof structure, whether of concrete or steel, must be such that it will support the use of swinging

Double Gymnasium
Port Credit Secondary School
Architects / Craig, Madill, Abram & Ingleson

Gymnasium
Cornwall Collegiate and Vocational School
Architects/Comber & Mack

apparatus.

If the structure is poured concrete then the bolts must be cast in place, and if of precast concrete then the bolts must be cast-in during manufacture. A suspended flush ceiling must never be used because of susceptibility to damage.

g) Exits and Entrances

All exits and entrances should be located with a regard for traffic flow. Traffic flow across the gymnasium floor in street shoes must be avoided. If possible, doors should be flush with the inside walls to minimize projections and reveals, and as a safety measure, doors should open outwards to avoid obstructing the inside space. All sills should be flush with the gymnasium floor. Glazed doors or panels should be amply protected.

h) Spectator Accommodation

Since gymnasia are often used for a variety of presentations such as gymnastic meets, basketball games, theatre, operettas, it may be desirable to have spectator accommodation. However, this accommodation should not be obtained at the expense of instructional space. The recommended solution is the installation of folding bleachers. Poured concrete bleachers are not desirable. Folding bleachers in mezzanine or balcony areas maintain these locations as extra activity areas. This seating accommodation should be located so that spectators may reach it without traffic across the gymnasium floor.

The primary purpose of a gymnasium is for the program of physical education. *Its use for assembly purposes is only secondary*. This should be kept in mind in a consideration of spectator accommodation.

i) Acoustics

Sound, reverberation and echo are often so great that they constitute a major instructional problem in gymnasia. The provision of some reasonably economical acoustic treatment is therefore highly recommended. Sound absorbent material could be used at high level to reduce the reverberation time. Under *ideal* circumstances, the reverberation time should not exceed 1.6 seconds.

j) Lighting

Progressive design practice tends to reduce window areas in physical education facilities. The following are some disadvantages in the use of a large glazed area:

i Glare. In actual practice the windows are usually covered with drapes which are rarely opened.
ii Breakage.
iii Heat loss (or heat gain) and condensation.
iv They limit the use of walls as an instructional aid.
v Natural lighting is never sufficient.
vi Windows should not be the primary source of air supply for ventilation purposes.

The quality and intensity of artificial lighting is most important. The colour scheme of the gymnasium has a direct bearing on the quality of light in the gymnasium. Generally speaking, light colours are desirable. The ceiling should have an 85 per cent reflection factor, upper walls 65 per cent, lower walls 40–60 per cent and floor 30–40 per cent. An absolute minimum of 30 foot candles taken 4 feet above the floor should be maintained. Light fixtures should be so arranged that they provide uniform light of the required standard throughout the gymnasium area and eliminate loss of light intensity in the roof space. Light fixtures should not be above the lowest point of the roof structure. Fixtures should be capable of easy maintenance. A light dimmer is only necessary for auditorium use. This expense is unnecessary for physical education activity.

k) Ventilation and Heating

The type of heating and ventilating should be selected with special consideration for economy of operation and for capacity to provide desirable thermal and atmospheric conditions. Temperature controls in the gymnasium should permit regulation independent of the rest of the school. Since physical education facilities now tend to be used throughout the entire year, circulation of air and ventilation standards should take into account summer use. Where the possibility of transmission of noise by way of ducts etc., exists, special sound proofing should be used. There should be more than one thermostat and each thermostat should be individually controlled, safely guarded and recessed. The relative humidity should be maintained at the necessary comfort index.

Air should be supplied so that there is no noticeable noise from air movement or from mechanical apparatus. The ventilation system should provide for an absolute minimum of 6 air changes per hour. At least 3 of these should be fresh, outside air, with the remainder being re-circulated air. The temperature should be 60–65 degrees taken at 4'0" above floor level. Forced air circulation, which should be buffered if outlets are not located at ceiling, is desirable. The system should be quick responding. Hot water has not proved to be a successful method of heating gymnasia. The ventilating system should contain both de-humidifiers and dust filters.

l) Folding Door

The door should operate electrically and in the case of power failure should allow manual operation. It should be solid and not easily damaged. Wood is desirable. There should be as much sound insulation as possible The door should have no open spaces above, below or around it. Complete division between the two gymnasia is essential. The hanging type of suspension is suggested; floor track is not recommended. Allowance should be made in installation of the door for building settlement and deflection of the roof structure. A small connecting door in the folding door is desirable. When open, the folding door should be completely recessed. Areas of ancillary facilities must not be reduced in order to accommodate the folding door.

m) Electrical Outlets and Public Address

The following electrical outlets should be provided either for immediate or for future use.

i 6 inputs, one for the P.A. in each half of the gymnasium, one for the use of record player in each half of the gymnasium and one in each instructor's office. The microphone and record player inputs should only be coupled to the loud speakers in the gymnasium. There should be several loud speakers — at least 2 in each half of the gymnasium, and one in each dressing room. From each input it should be possible to operate either for its small gymnasium only, or for the large gymnasium, as required.

ii A clock outlet in each half of the gymnasium.

iii Flush exit lights, with wire guards over each exit.

iv There should be a reasonable number of wall mounted convenience outlets located strategically mounted around the gymnasium.

v If the installation of an electric scoreboard is contemplated, either immediately or in the future, the wiring for it should be installed in the gymnasium wall at the time of construction.

Light fixtures should be individually controlled or banked.

There should not be just one master switch.

2. Dressing Rooms

Two dressing rooms are required, one for boys and one for girls. The recommended sizes are 900 sq. ft.

Gymnasium
Midland Avenue Secondary School
Architects/Craig, Madill, Abram & Ingleson

for boys and 550 sq. ft. for girls. These areas are designed to accommodate a physical education program up to double gymnasium size. Up to 100 boys, including all extra curricular activity, can be handled in this size. Where a team room is provided, it should be 350 sq. ft. and the boys' dressing room can be reduced to 550 sq. ft. A dressing room of this area will accommodate two classes at one time (approximately 70 boys). It is preferable to have a dressing room *and* team room. Ceiling height should be a minimum of 9 ft. The floors should be of an impervious, non-slip material — not concrete unless it can be well sealed. Drains should be installed, including one close to the drying room exit. Floors should be sloped to the drains to facilitate hosing and cleaning.

Walls should be protected by a moisture-resistant finish to facilitate cleaning. A hot water hose connection is a janitorial necessity. Controls for this connection should prevent student operation. Sharp corners and projections should be avoided in this room. Toilets, drying rooms and shower rooms should be separate units with direct access to dressing rooms. Doors are not necessary between these areas and the dressing rooms.

The dressing room should be located so that the following access routes and exits are possible:

a) School corridor to dressing room
b) Instructor's office to dressing room
c) Gymnasium to dressing room
d) Washroom to dressing room
e) Drying room to dressing room
f) Playing field to dressing room or corridor directly to outside

Screens must be provided as a visual barrier at entrances at a, c, and f. Gymnasium and service areas should be on the same level.

Locks should be fitted to the following doors:

a) Corridor to general gymnasium area
b) Dressing rooms to gymnasium
c) Instructors' rooms
d) Storage and special service areas

Lighting fixtures should be protected and should provide a light intensity of 15 foot candles taken at 4'0" above the floor level. Light controls in all dressing rooms, drying rooms, shower rooms and washrooms should be key type switches.

Extremely good ventilation is essential in this area. An adequate exhaust system is imperative. In this respect the majority of existing schools are deficient. The system should provide a minimum of 6 air changes per hour, 3 "outside" and 3 "re-circulated". The heating system should maintain a temperature of 78-80 degrees taken 5'0" above the floor. Wet floors are a constant hazard in this room. School planners are reminded that in an average school day over 400 students will use this facility.

The installation of lockers and lockerettes in the dressing room is not recommended. If a tote box system is desired, a separate room, extremely well ventilated, is necessary to house the boxes. In the dressing room, fixed benches, 16 ins. wide and 18 ins. above the floor, should be provided at all available wall space. Cleaning is much easier if these benches are attached to the wall rather than to the floor. 5'10" above the floor a 12 in. shelf should be provided above all benches. Hooks should be installed on the wall just below the shelf, at 15 in. intervals. They should be sufficient in number to accommodate maximum student load. These hooks should have short projections only.

Provision should be made for the installation of a 3'0" by 4'0" bulletin board in the dressing area.

Mirrors should be conveniently located on the walls. A clock and a loud speaker, both connected to the school system, should be provided. There should be a drinking fountain in the dressing room. The installation of a valuables box is desirable—slot and baffle type.

3. Drying Room

It is through this room only that traffic should be able to move between the shower room and the dressing room. This room should be as nearly square as possible. A minimum floor size of 140 to 150 sq. ft. is recommended. There should be no furnishings except for short, rust resistant hooks for towels. Hooks are preferred to towel rails. These hooks should be placed at a height of 5'0" from the floor. There should be a 4 in. curb or equivalent between the dressing room and the drying room. The floor should be non-slip and properly drained. Walls should be of a moisture-resistant material. Lighting must be moisture proof. Good ventilation is very important. Recommended ceiling height is 9'0".

4. Shower Rooms

There should be a shower room for boys and a shower room for girls. There are differences in these two shower rooms which are discussed following the general comments which pertain to both areas.

a) General Comments

The shower rooms should be accessible only through the drying rooms. They should be as nearly square as possible. The minimum recommended size is 15'0" by 15'0" with a minimum ceiling height of 9'0". This area is adequate for up to 100 students.

Floors must be non-slip and walls must be of moisture-resistant material. Proper floor drainage is vital. This does *not* mean one drain in the centre with the floor sloped towards it. It invariably becomes clogged. The floor should slope from the centre to the walls with a gutter and drains. Another method is to slope the floor to the door between the shower room and the drying room, with a large, slatted, non-ferrous drain in between to serve both areas.

Of the various shower control systems, the master control is generally thought best. Water temperature and pressure are regulated by controls in a recessed and locked panel located in the dressing room wall just outside the entrance to the drying room—not in the instructor's office. Two or three individually controlled shower heads may be preferred in some cases.

Light fixtures must be moisture proof. The ventilation system must provide at least 6 air changes per hour, 3 "outside" and 3 "recirculated." Temperature should be maintained at 75-80 degrees taken at 5 ft. above the floor. Lighting should provide 10-15 foot candles taken at 4 ft. above the floor and light controls must be outside the shower room. A separate exhaust fan for the shower room is most desirable. Recessed soap holders, or liquid soap dispensers are also necessary.

b) Boys

A minimum of 10 and a maximum of 12 shower heads is recommended. These shower heads should be placed at a height of 6'6" from the floor. Individual heads around the walls are generally more efficient than the pedestal, column or pillar type of shower.

c) Girls

Individual shower cubicles with an attached individual change area are recommended. If this type of installation is employed, there will of course have to be certain modifications in some of the general statements. A minimum of 6 of these cubicles is recommended. If the shower cubicles are installed down the centre of the room, with a change cubicle attached on each side, the maximum use which may be made of each shower is almost doubled. With this type of installation, a more rectangular shaped room might be desirable. Each change cubicle should contain a fixed seat and hook for clothes and towels. Each shower should have its own drain.

If an open shower room is used, 2 of the closed cubicles with attached change area should also be provided. Shower heads for girls should be placed at a height of 56 ins. from the floor. If hair dryers are provided for the girls, they should be provided in the dressing room.

5. Washroom

This room should *not* serve as a general school washroom, but the number of fittings may be regarded as part of the total required for the school. It should be a separate room serving only the dressing room. Access to it should be possible only through the dressing room. There should be a minimum of 2 toilets, 4 urinals and 2 wash basins for the boys, and of 4 toilets and 2 wash basins for the girls. Mirrors should *not* be installed in this room. Ideally, the ventilation here should have no connection with the change room ventilation. However, if it is connected, the system should be such that the instructor's office and change room air is directed *towards* the showers and toilets and then out. Make sure that it is exhausted in the proper direction. Floor, ceiling and walls should be of the same construction and finish as in the shower room.

6. Instructors' Offices

There should be an instructor's office for the male staff and a second instructor's office for the female staff. In each case, this room should have a minimum size of 225 sq. ft. and a minimum height of 9'0". A wash basin, mirror, medicine cabinet, toilet and shower should be provided in a separate room or roomette within the office. Locker accommodation should be provided sufficient for physical education staff and team coaches. The shower should be arranged so that its use does not tie up the other facilities. Adequate provision should be made to ensure that water does not escape onto the office floor. Good ventilation is essential. Heating should be thermostatically controlled since the gymnasium is to be maintained at 60-65 degrees. Lighting should give a reading of 25-30 foot candles at desk level. Doors should be provided between the Instructors' offices and 1) the gymnasium, 2) the dressing room, 3) the school corridor.

A shatter-proof vision panel—24 ins. square, with sill 4'0" above floor level, should be provided between 1) the physical education office and the gymnasium, for between–period supervision and extra curricular visual supervision of student controlled activity, and 2) the physical education office and the change room. One-way glass should not be used. The normal school P.A. system should be installed in the office. A minimum of 2 duplex outlets should be provided. Teachers connected with extra-curricular physical education activity should use these rooms.

7. Storage Areas

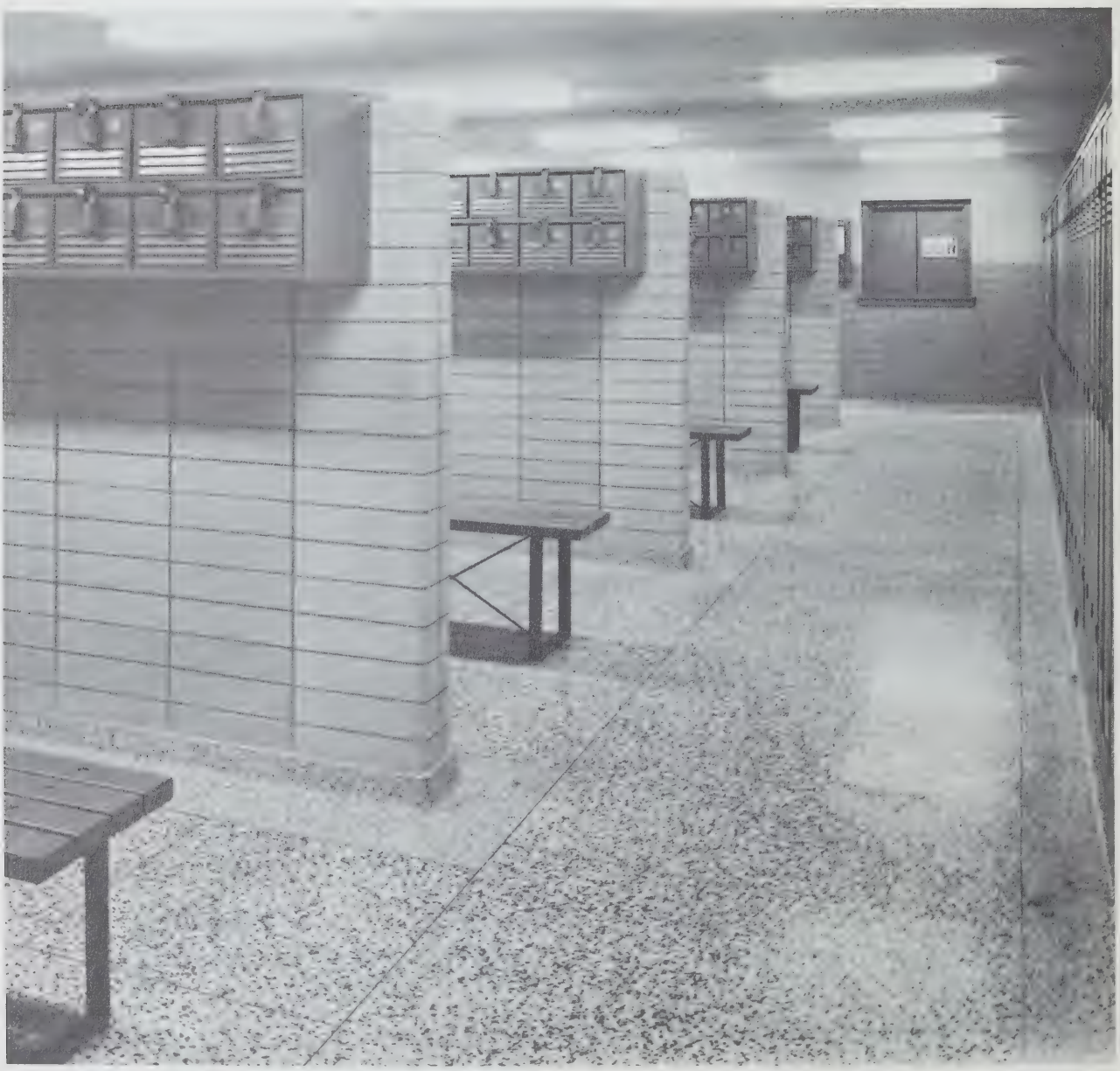
In most schools at present, storage is a major problem because of 1) location, 2) insufficient space. Ideal conditions require the provision of 6 types of storage space:

a) Heavy gymnastic apparatus
b) Supplies in daily use
c) Dead storage
d) Outside storage
e) Chair storage
f) Community group storage

a) Heavy Gymnastic Apparatus

This equipment should be stored in a single room with a floor area of at least 700 sq. ft. of usable floor space and with openings into each half of the gymnasium. In a single gymnasium a room of 450 sq. ft. is sufficient for this purpose. The floor should be level with the gymnasium floor. The door should

Gymnasium
Cornwall Collegiate and Vocational School
Architects/Comber & Mack



Changing Room
Eastdale Secondary School, Welland
Architects/Arthur B. Scott & Associates

be of heavy, overhead roll-up type. It should be at least 6 ft. wide. The ceiling must be at least 8 ft. high in order to store standards etc. Lighting should be recessed and protected.

b) Supplies in Daily Use

There should be one of these rooms serving each half of the double gymnasium. It is for storage of balls, racquets, nets, timers' jerseys, team sashes, wooden pins, record player, records, etc. It will contain shelving and cupboards on all walls. A minimum of 120 sq. ft of floor space is recommended. These areas should be directly accessible to the gymnasium. Standard ventilation should be provided.

c) Dead Storage (Boys)

This area is for storage of out-of-season uniforms—football, basketball, track and field, gymnastic, etc.—and out-of-season equipment. Good ventilation in this area is essential. Shelving and cupboards will be required on all walls. This area need not open into the gymnasium, but it should be in the general physical education facility area. Equipment marking, minor repairs, issuing of equipment, etc. are all done in this area. A minimum of 225 sq. ft. of floor space is desirable. A Dutch-door should be installed, opening into the storage area.

d) Outside Storage

This area should open directly onto the playing field and should be sufficient in size to accommodate blocking sled, blocking dummies, field markers, jump standards, shot and discus circles, hurdles, vaulting poles, lime for marking the field, etc.

e) Chair Storage

Adequate chair storage should be provided to accommodate the maximum number of chairs for assembly purposes. If any of the above storage facilities are *not* provided, the area of the storage areas provided should be increased accordingly.

f) Community Group Storage

Separate storage should be provided, large enough to accommodate equipment used by all the community groups.

8. Special Service Areas

a) Visitors' Dressing Room

A visiting team dressing room is most desirable. The physical make-up of this room should correspond to the gymnasium dressing room except for size. A floor size of 400 sq. ft. is adequate. This dressing room should have its own shower and toilet facilities.

b) Team Room

A team room is most desirable for the successful operation of large scale after-school activities. Uniforms are stored and dried here during the season. Without this room the storage of 80 or more wet football uniforms is a very real problem. This use as a drying area is very important. The room also serves as a changing room for school teams, leaving the gymnasium free for intra-mural activities. These intra-mural activities could involve up to 100 boys and girls. Ideally, shower rooms, drying rooms and other ancillary areas should be provided for this team room. Ventilation, lighting and heating should be equal to that of the main dressing room. A team room should have a floor area of 350 sq. ft.

c) Activity Room

The use of otherwise wasted space as activity rooms should be discussed with department officials.

9. Stages

Although the primary function of physical education

facilities in secondary schools is to meet the program requirements of the physical education activities, it is recognized that a single or double gymnasium may have to act as the school assembly area where no auditorium exists. Under these circumstances therefore, a stage will be necessary. The area of the stage and any facilities directly related to stage activity should not reduce the clear dimensions set forth for physical education purposes. The related facilities may include a projection booth. This projection booth should not encroach upon the clear area of the gymnasium. A stage which is required to meet basic assembly purposes should be simple in form. It should be remembered that if the stage area in a school building exceeds 1,200 sq. ft (including wings), it must meet the requirements of section 3.3.2.6 of *The National Building Code.* The regulations of the Ontario Fire Marshal set forth in the *School Fire Safety Design Standard* should be checked carefully in order to avoid unnecessary expense in fire-proofing.

If a proscenium opening is to be provided, its design and materials should not interfere with the physical education activities carried out in the gymnasium.

Careful consideration should be given to the requirements of the stage and related facilities, since it may require considerable expenditures for the facilities and equipment, if elaborate standards are set.

10. Swimming Pool

The value of swimming facilities to a community is unquestioned. A pool is a relatively expensive facility, however, and close consultation with all possible user-groups in the community should develop, prior to architectural planning, to ensure maximum use.

The needs of the various communities will differ and recognition of these needs will affect the ultimate design of the facility.

The Division of School Planning & Building Research will be pleased to forward general outlines regarding pool facilities on enquiry. It should be noted that plans and specifications of the pool and its auxiliary areas, including site plan, mechanical, electrical, plumbing and drainage, shall be submitted to the Department of Health. The Department of Health will send its report thereon to the local Medical Officer of Health. The local Medical Officer of Health will inform the School Board of approval or necessary changes and a copy of the letter will be sent to the architect concerned.

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